

Chapter Six AIRPORT DEVELOPMENT ALTERNATIVES

The airside and landside facilities needed to satisfy projected aviation demands through the planning period were identified in the previous chapter. The next step in the master planning process is to evaluate the various ways those facilities can be provided. There are many possible combinations of alternatives, so some intuitive judgment must be used to identify those alternatives which have the greatest potential for implementation.

There are several functional areas which must be considered in the preparation of development alternatives at Pinal Airpark. These include airfield facilities such as runways, taxiways, aircraft hangars, and tie-down areas; and support facilities such as roadways and access to utilities. It is essential that individual demands are accommodated while maintaining a high degree of compatibility with other airport components. Therefore, all areas must be evaluated individually as well as collectively to ensure a final development plan that is functional, efficient, and cost-effective and which minimizes environmental impacts.

The previous chapters have identified present and future needs in each functional area of Pinal Airpark. Existing and near-term facility needs can be quantified because specific demand levels have been reached or will be reached within a short time. However, despite the best information available, it cannot be assumed that future events may not change these needs. The master planning process attempts to develop a viable concept for meeting the needs created by projected demands over the next twenty years. No development program should be adopted that would preclude expansion beyond the twenty-year period or that would require expansion commitments prior to certainty of need.

The alternatives considered in this evaluation were not limited to those that would result in full-scale development of Pinal Airpark. The "No Development" and "Development of Other Sites" alternatives were also considered. The alternative concepts presented on the following pages provide a preliminary view of the most viable development options capable of accommodating projected aviation demands at the airport. During the initial evaluation process, operational efficiency, impact on existing facilities, and environmental impacts were considered. Following the review of the preliminary alternatives, a "preferred alternative" was developed. The refinement of the preferred alternative included additional detail on facility layout, including cost estimates. Through this type of coordinated analysis of alternatives, a basic airport facilities concept can be transformed into a realistic development plan.

NO DEVELOPMENT ALTERNATIVE

In analyzing and comparing costs and benefits of various development alternatives, it is important to consider the consequences of no future development at Pinal Airpark. The "No Development" alternative essentially considers maintaining the airport in its present

condition and not providing for improvements to the existing facilities. The primary result of this alternative would be the eventual inability of the Airpark to adequately accommodate increasing demands of Airpark tenants and users.

The forecast and facility requirements analyses indicate current and future need for runway and taxiway improvements, additional hangars and aircraft parking areas, and the aviation-related business park. The "No Development" alternative would not address these needs and would, therefore, constrain airport operations. An inability to develop additional facilities, combined with the existing facility constraints, could result in declining activity at the airport and the possible loss of Evergreen Air Center. Attempting to continue operating with existing facilities will eventually create operational difficulties at the airport. Many existing deficiencies will increase in severity if no corrective action is undertaken.

A decision to adopt a "No Development" alternative is inconsistent with the management and development policies of Pinal County, based on its interest in providing airport facilities in Southern Pinal County. Local and regional use of Pinal Airpark as a safe, efficient facility would be compromised through the implementation of a "No Development" Alternative. **Therefore, the "No Development" Alternative is not recommended for Pinal Airpark.**

TRANSFER SERVICES TO ANOTHER AIRPORT ALTERNATIVE

The alternative of providing aviation services at another airport was found to be impractical due to the lack of nearby airports that possess adequate facilities to meet the unique aviation demands of the Airpark operator and other tenants. The absence of available airports with similar capabilities, coupled with the favorable airspace and area land uses, eliminates this alternative from consideration. **Therefore, transferring services to another airport is not recommended.**

BUILD A NEW AIRPORT ALTERNATIVE

An option related to transferring service to another airport is to construct a new airport in the local area. This option would consist of developing a new airport at a new site and closing the existing airport. The Pinal Airpark site provides convenient access to major market centers that provide support for this most important facility. The existing site is one of the few airport facilities in the United States with excellent weather and unrestricted airspace. Many of the Airpark's tenants are at this location because of these factors. The Arizona Army National Guard and the Department of Defense (DOD) training facilities are located on or adjacent to Pinal Airpark because of its unique location, facilities, and activity. The surrounding terrain is also conducive to the very large number of training activities that take place at the Airpark. **Therefore, building a replacement airport for Pinal Airpark is not recommended.**

DEVELOP THE EXISTING AIRPORT ALTERNATIVES

The commitment to remain at the existing site and to develop facilities that are adequate to meet long-term aviation demands includes meeting the following requirements:

- Provide sufficient airside and landside capacity to meet long-term aviation demand at Pinal Airpark in Southern Pinal County.
- Improve the functional configuration of the airfield and associated facilities.
- Provide inducement for private development of aviation facilities.
- Improve airfield safety and operational efficiency.

AIRFIELD CONSIDERATIONS

Airfield facilities are, quite naturally, the primary focal point on an airport. Because of their fundamental role and physical land area requirements, airfield facilities directly affect the development of other airport facilities. In particular, the runway-taxiway system has the greatest impact on overall airport development. The facility requirements analysis was based on guidelines presented in FAA Advisory Circular 150/5325-4A, **Runway Length Requirements for Airport Design**, and indicated that the existing runway length is inadequate to accommodate commercial jets under a range of operating conditions. A 1,500-foot extension would increase the length of Runway 12-30 to 8,400 feet and would improve the airport's ability to accommodate the larger commercial jet aircraft fleet serviced by Evergreen Air Center. However, additional discussions with Evergreen indicated that a length of 10,000 feet would be required to significantly expand their operating capabilities. The existing width (150 feet) meets FAA design standards, while the pavement strength (150,000 pounds dual-tandem-wheel loading) is only adequate to accommodate the design aircraft (Boeing 747) and the other wide-body jet aircraft which will continue to use the runway. Area wind data indicates that Runway 12-30 is oriented to provide adequate wind coverage for the typical large aircraft using the facility. Therefore, based on existing wind coverage, a crosswind runway is not required.

DEVELOPMENT ALTERNATIVES

The following narrative describes three basic development alternatives presented for Pinal Airpark. All the alternatives (identified as A, B, and C) are capable of accommodating projected airside facility demands through the twenty-year planning period. After these development alternatives are evaluated and refined to provide the best development concept for the airport, final planning efforts can be concentrated into developing the recommended Airport Master Plan. A discussion of the refined (preferred) alternative is provided at the end of this chapter.

Development Alternative A

This alternative, as shown in **Figure 7A**, extends the existing Runway 12-30 approximately 1,500 feet, giving it a total length of 8,400 feet. The runway width is designed to remain at 150 feet. It is necessary to divide the extension between the two runway ends rather than having the full extension off just one end, because the location of the Army National Guard helicopter facility does not permit the parallel taxiway extension to be constructed to its full length. To develop the full length of both the runway and taxiway to the north, relocation of the existing ANG helicopter landing pads would be necessary. This alternative would place the end of the runway closer to the ANG helicopter landing pads, thus causing a possible conflict between the helicopter training and fixed-wing operations.

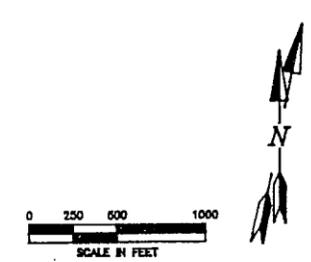
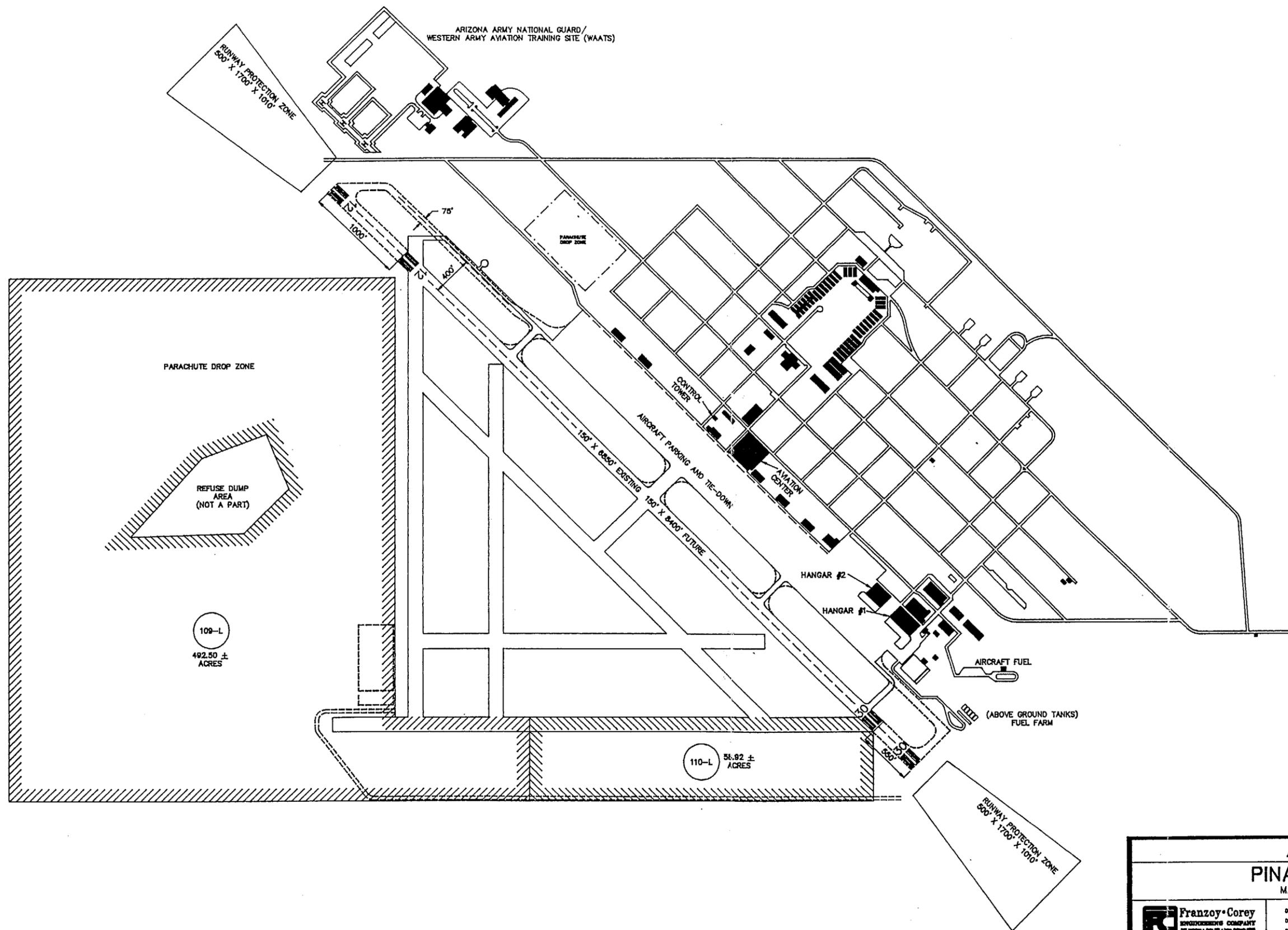
Alternative A would not add to the aircraft parking capacity within the east-side aircraft apron area. It would, however, allow the continued use of the full long-term aircraft storage area west of Runway 12-30. There would also be no loss of the land area proposed to be acquired and utilized by the DOD training operation.

With the required development of the approach end of Runway 30, it will be necessary to acquire 10 acres of additional land. This area would be required to control the Runway Protection Zone and allow the construction of the additional runway length and 1,000-foot safety area. The estimated cost of the runway and taxiway extension and land acquisition would be approximately \$5,085,210.

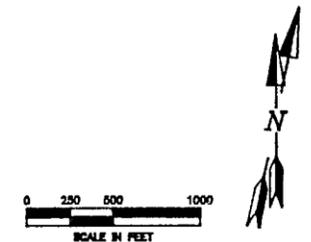
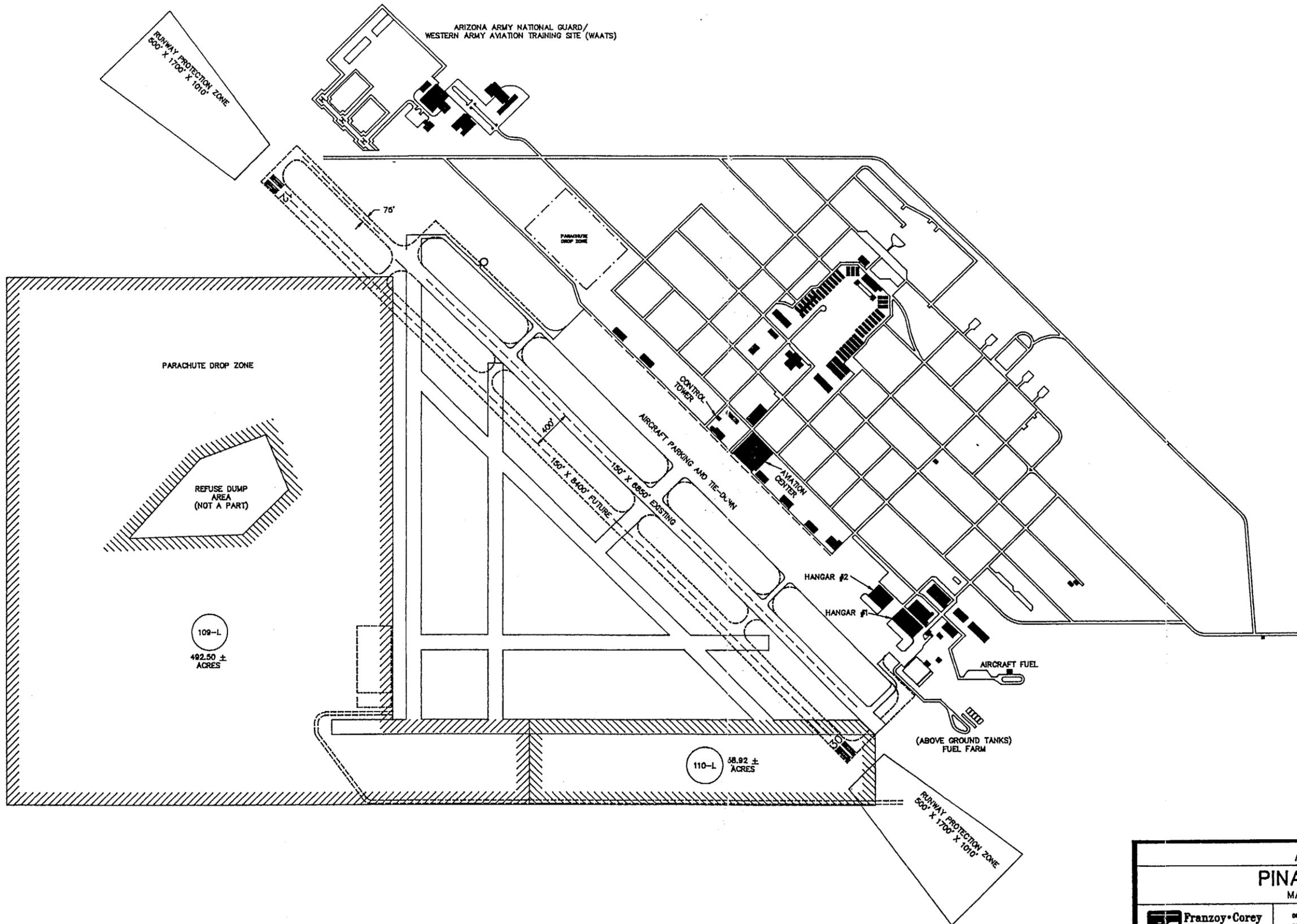
Development Alternative B

Alternative B, in **Figure 7B**, shows a new 8,400-foot runway constructed 400 feet west of the existing 6,850-foot Runway 12-30. The Runway 30 end of the new facility would be constructed at the same location as the existing Runway 30 end. The additional runway length would be developed completely to the north. The proposed separation from the existing runway would allow the use of the existing runway as a parallel taxiway. The existing runway could be extended the full length of the new runway without affecting the ANG helicopter training facilities or operation.

The added separation of the proposed Alternative B runway location would allow the addition of approximately 20 acres of aircraft parking in the area east of the existing runway. This could add space for an additional 32 large aircraft to be parked in the terminal/hangar apron area. The shift in the runway location by 400 feet would reduce the long-term aircraft storage to the west of the runway by as much as 25 aircraft. The shift in the runway to the west of the existing Runway 12-30 would reduce the land requested by the Department of Defense by approximately 18 to 20 acres, for a loss in revenue of \$28,000 or more to Pinal County. The estimated cost for the development of the new runway and the extension to the existing runway, which would become the parallel taxiway, would be approximately \$15,169,000.



ALTERNATIVE A		
PINAL AIRPARK		
MARANA, ARIZONA		
Franzoy + Corey ENGINEERING COMPANY <small>REGISTERED PROFESSIONAL ENGINEERS</small>	DESIGNED BY: <u>J. HARVEY, A.E.</u>	FIGURE 7A
	DRAWN BY: <u>E. CHAMBERLIN</u>	
	DATE: <u>APRIL 12, 1991</u>	



ALTERNATIVE B		
PINAL AIRPARK		
MARANA, ARIZONA		
<p>Franzoy+Corey ENGINEERING COMPANY</p>	DESIGNED BY <u>A. DANLEY, A.E.</u>	FIGURE 7B.
	DRAWN BY <u>S. KENNEDY</u>	
	DATE <u>APRIL 12, 1991</u>	

Development Alternative C

Alternative C (see Figure 7C) is similar to Alternative B in that a new full-length runway would be constructed to replace the existing Runway 12-30. The difference between Alternatives B and C is the separation between the two facilities. The proposed runway would be located a minimum of 700 feet from the existing Runway 12-30. The 700-foot separation is required by the FAA for parallel VFR operation runways. The projected level of operations through the planning period does not support the requirement for a parallel runway, but it would be in place if needed beyond the year 2010. There is always the possibility that a new Airpark tenant could bring increased operations to the airport, making a second runway necessary. It would also allow the closure of a runway for reconstruction or maintenance without completely closing down the airport. The location of the proposed runway and parallel runway/taxiway would not cause an impact on the flight operations of the ANG.

The location of the proposed runway in this alternative would allow the expansion of the aircraft parking apron to the east by approximately 20 acres, as with Alternative B. The added separation between the proposed runway and parallel runway/taxiway would reduce the land available to the Department of Defense for its operation by approximately 33 to 35 acres, for a reduction of over \$55,000 from the land sale by Pinal County. The existing hard-surface aircraft storage area to the west of Runway 12-30 would be reduced by an estimated 32 acres. This would equate to approximately 20 aircraft that would no longer be stored west of the runway.

Alternative C has an estimated cost for construction of approximately \$16,301,000. The difference in construction costs between Alternatives B and C is the added access taxiway length of 300 feet each. With 5 new access taxiways between the two facilities, the total pavement area would be increased by 12,500 square yards.

SUMMARY

Three preliminary airport development alternatives were presented in this evaluation. The alternatives provide airfield development concepts that would provide the basic runway facility necessary to meet the future aviation demand at Pinal Airpark. These concepts will provide facilities that will meet existing demands as well as that projected through the twenty-year planning period and beyond. The common objective of the alternatives is to provide aviation facilities which are capable of accommodating demand efficiently and cost-effectively. Table 6-1 briefly summarizes the specific elements of each alternative.

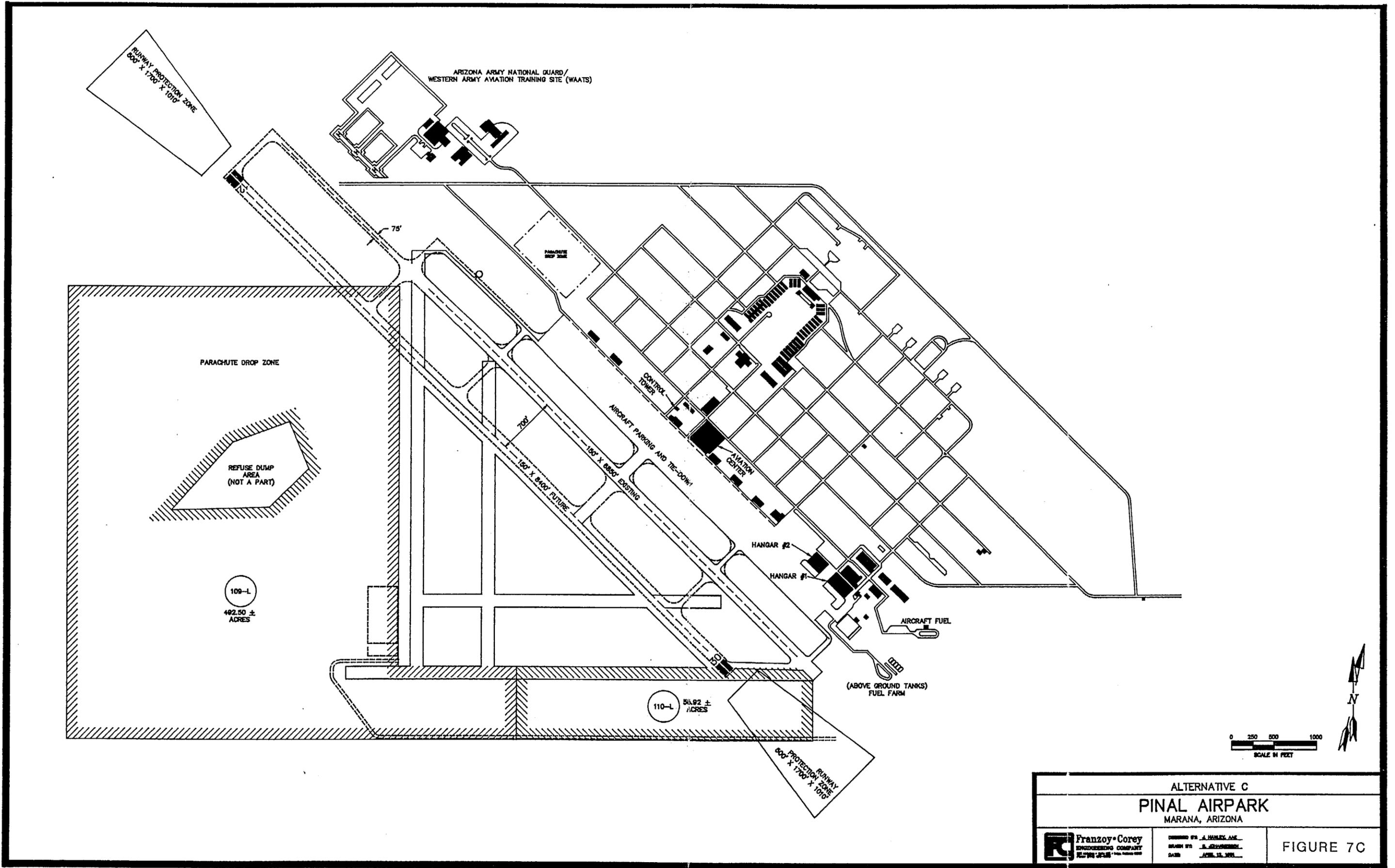


Table 6-1
PRELIMINARY AIRPORT DEVELOPMENT ALTERNATIVES SUMMARY
Pinal Airpark Master Plan

<u>Evaluation Factors</u>	<u>ALTERNATIVES</u>		
	<u>A</u>	<u>B</u>	<u>C</u>
Improvement Cost	\$5.0 million	\$15.1 million	\$16.3 million
Land Acquisition	10 acres	No acreage	No acreage
Aircraft Park (gain)	No acreage	20 acres	20 acres
Aircraft Park (lost)	No acreage	-15 acres	-32 acres
DOD Land Impact	No acreage	12 acres	33 acres

REFINED AIRPORT ALTERNATIVE

Based on the results of the Planning Advisory Committee meeting and continued discussions with Pinal County and the Airpark tenants, the development concepts contained in Alternative A were recognized as the preferred planning approach for Pinal Airpark. Alternative A provided for the continued operation of a single runway (12-30), with additional runway length developed as justified by demand. Following a presentation of the options related to the proposed 1,550-foot extension, it was determined that adding the entire runway extension at the north end of the runway would be preferable to dividing the extension between both runway ends. The location of the Army National Guard helipads along the proposed alignment of the extended parallel taxiway, will create an operational conflict. It will be necessary to relocate the helipads to provide required fixed or movable object clearance from the taxiway. However, the need to provide jet blast protection for the nearby helipads may require additional separation for the northernmost future helipad.

With the concept of maintaining a single runway operation at Pinal Airpark firmly established, additional refinements to the preferred alternative were made which reflect additional input provided from Airpark users. Following the development of the initial concepts, Evergreen indicated that a runway length of 8,400 feet would only provide a marginal increase in capability for their operation. In order to significantly expand capabilities beyond the current runway, they identified a length of 10,000 feet as a basic requirement. As a result of this re-examination of facility needs, a review of operational requirements for the critical aircraft was conducted. The existing operations by the critical aircraft (B-747) and other large Transport category aircraft related to aircraft maintenance, storage, and training activities at Pinal Airpark involve relatively low operating weights.

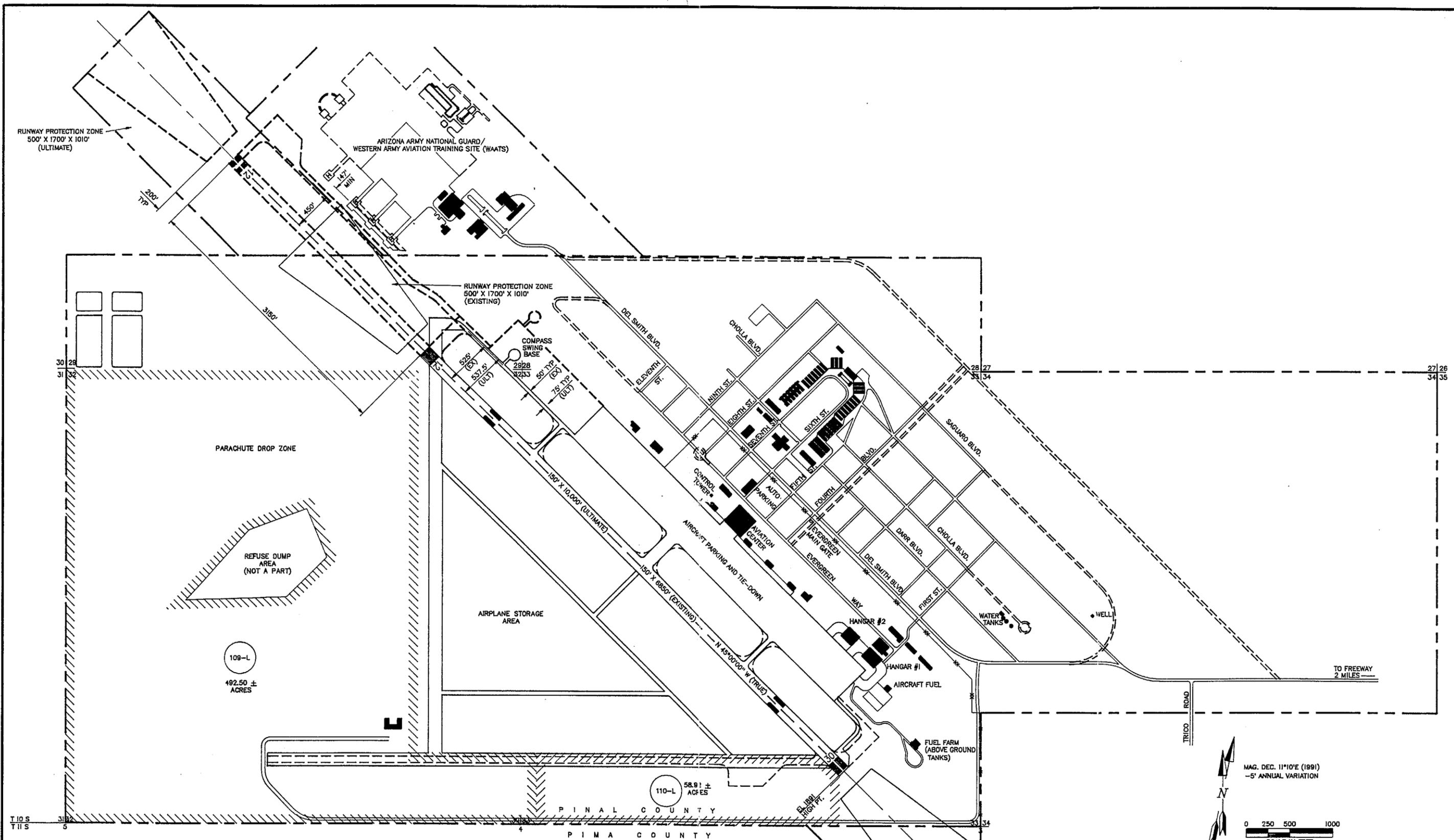
However, the possibility of expanding Pinal's operations to accommodate transport aircraft with typical commercial or military fuel/payload configurations would require additional runway length. The runway requirements of the critical aircraft vary depending on operating weights, but a runway length of 10,000 feet would be capable of accommodating the existing fleet of large Transport-category aircraft—civilian and military—under a variety of demanding operating conditions. The extension would be required only when typical operating weights of critical aircraft increase to the point where the existing runway is unable to accommodate their requirements.

Aside from the length of the extension, and the recommendation to provide the extension at the north end of the runway, the basic concepts are similar to those originally described in Alternative A. The issue of locating a parallel taxiway for the proposed runway extension does present some unique operational difficulties. The present location of the Army National Guard helipads does not provide adequate horizontal separation from the runway/taxiway system. In order to extend the parallel taxiway on the east side of Runway 12-30 and also maintain recommended FAA design standards, it will be necessary to relocate the helipads a minimum of 147 feet to the east. This relocation would provide the minimum acceptable wingtip separation clearance for design aircraft taxiing. The close proximity of the helipads to the runway/taxiway environment creates operational conflicts which are not ideal.

During discussions regarding the possibility of locating the extended parallel taxiway on the west side of Runway 12-30, several operational concerns were identified, particularly on the part of Evergreen. Their concerns focus primarily on the requirement to taxi a Transport category aircraft across an uncontrolled active runway. The question of safety is difficult to quantify, although any taxiing of aircraft on or across active runways is generally considered undesirable, unless absolutely necessary. It is felt that relocation of the helipads slightly to the east of the Army National Guard facility may prove more viable than constructing a taxiway on the west side of the runway. However, as noted earlier, the extension of Runway 12-30 to 10,000 feet is considered to be a long-term project. Current and near-term helipad operations could continue to operate in their current location. At the time demand justifies a runway extension or as the operational needs of the Airpark become more focused, the development could be reviewed. The 3,150-foot runway extension would require the acquisition of approximately 100 acres of state-owned land north of the current Airpark boundary. The preferred alternative is depicted in Figure 7D. Table 6-2 briefly summarizes the elements of the preferred alternative.

Table 6-2
SUMMARY OF PREFERRED AIRPORT ALTERNATIVE
(REFINED ALTERNATIVE A)
Pinal Airpark Master Plan

DESCRIPTION:	3,150-foot Extension to Runway 12 and Parallel Taxiway
LAND ACQUISITION:	Approximately 100 Acres
DEVELOPMENT COST:	\$11,120,000
AIRPARK LAND IMPACTS TO AIRCRAFT PARKING & DOD:	None



PARACHUTE DROP ZONE

REFUSE DUMP AREA
(NOT A PART)

109-L
492.50 ±
ACRES

110-L
58.91 ±
ACRES

PINAL COUNTY
PIMA COUNTY

RUNWAY PROTECTION ZONE
500' X 1700' X 1010'
34:1 NON-PRECISION
(3/4+ MINIMUMS)
(EXISTING)



MAG. DEC. 11°10'E (1991)
-5' ANNUAL VARIATION

0 250 500 1000
SCALE IN FEET

TO FREEWAY
2 MILES

PREFERRED ALTERNATIVE	
PINAL AIRPARK MARANA, ARIZONA	
 SFC ENGINEERING COMPANY 2151 Michelson Suite 222 Irvine, California 92715 (714) 478-2528	DESIGNED BY: _____ DRAWN BY: J. FARMILLEN DATE: SEPTEMBER 1991
	FIGURE 7D